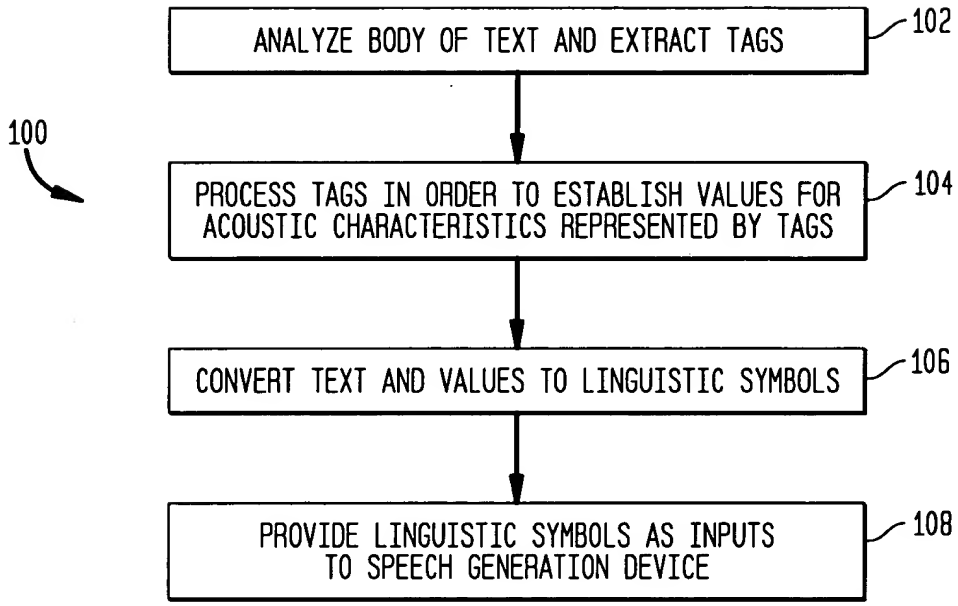
FIG. 1



Document 4 of 5 pages

FIG. 2

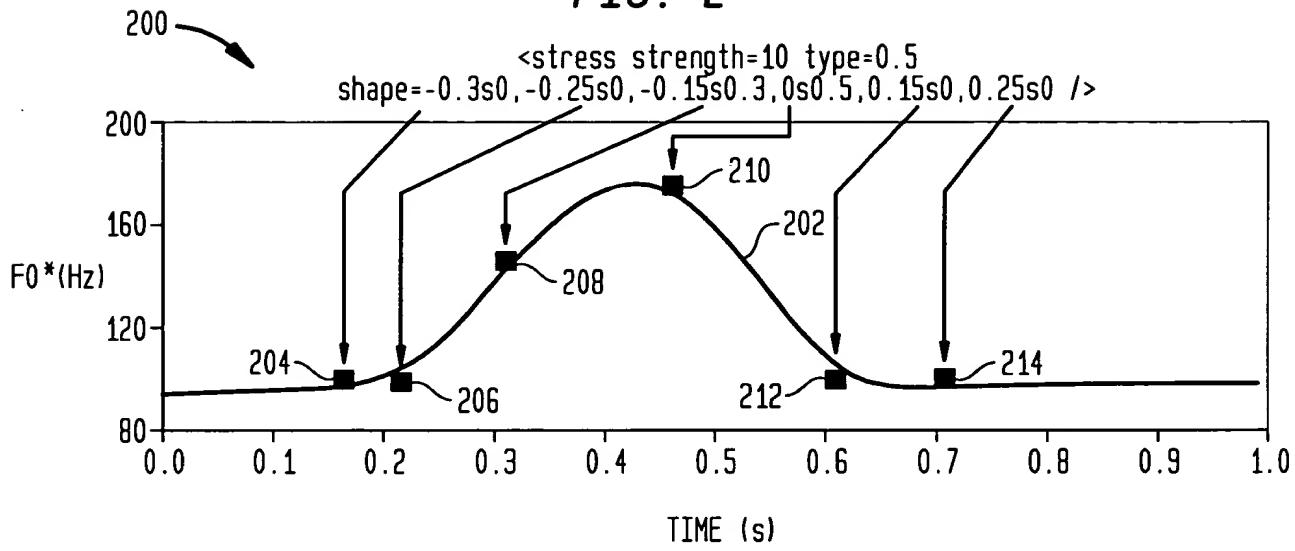

200
<stress strength=10 type=0.5
shape=-0.3s0,-0.25s0,-0.15s0.3,0s0.5,0.15s0,0.25s0 />
200
160
120
80
F0*(Hz)
210
202
208
204
206
212
214
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
TIME (s)

FIG. 3A

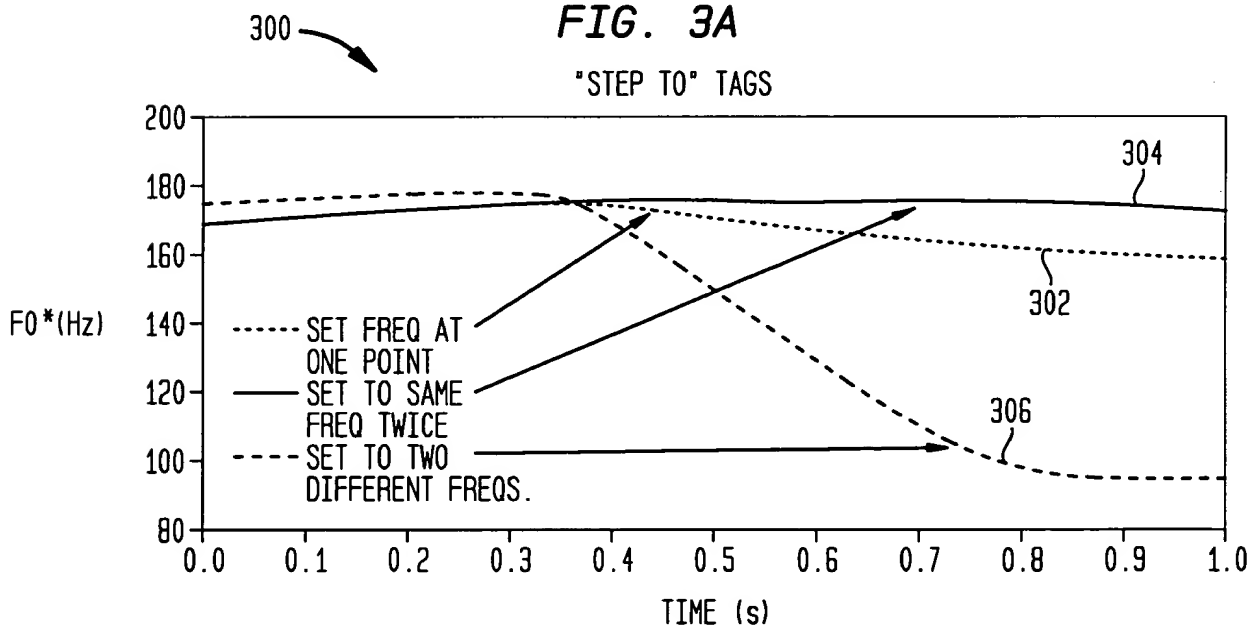

300
"STEP TO" TAGS
200
180
160
140
120
100
80
F0*(Hz)
304
302
306
SET FREQ AT ONE POINT
SET TO SAME FREQ TWICE
SET TO TWO DIFFERENT FREQS.
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
TIME (s)

FIG. 3B

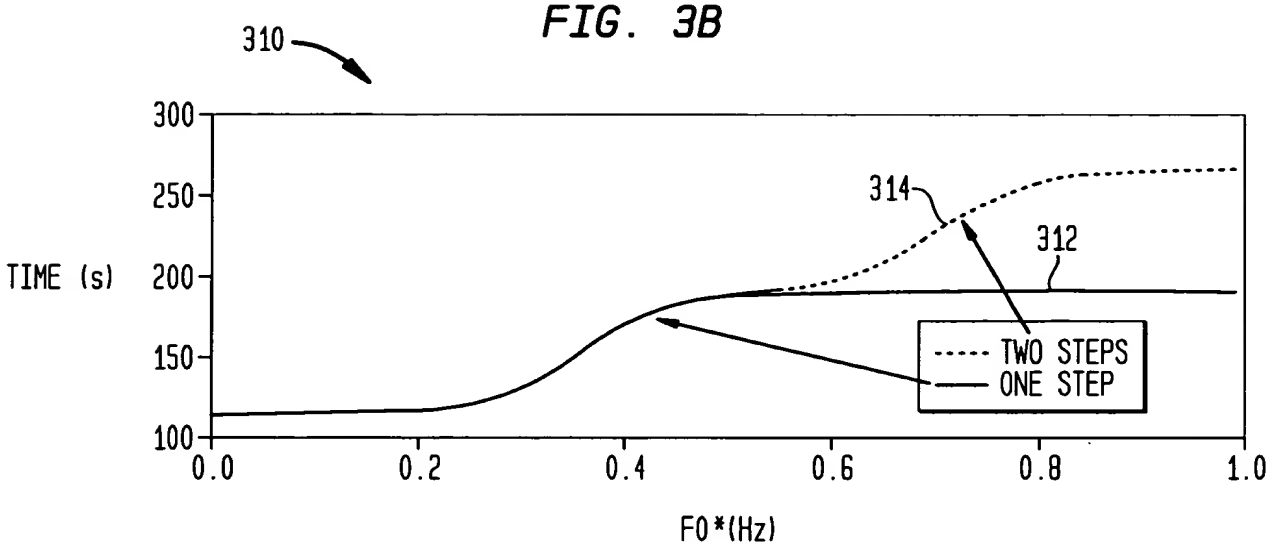

310
300
250
200
150
100
TIME (s)
0.0
0.2
0.4
0.6
0.8
1.0
F0*(Hz)
314
312
TWO STEPS
ONE STEP

FIG. 3C

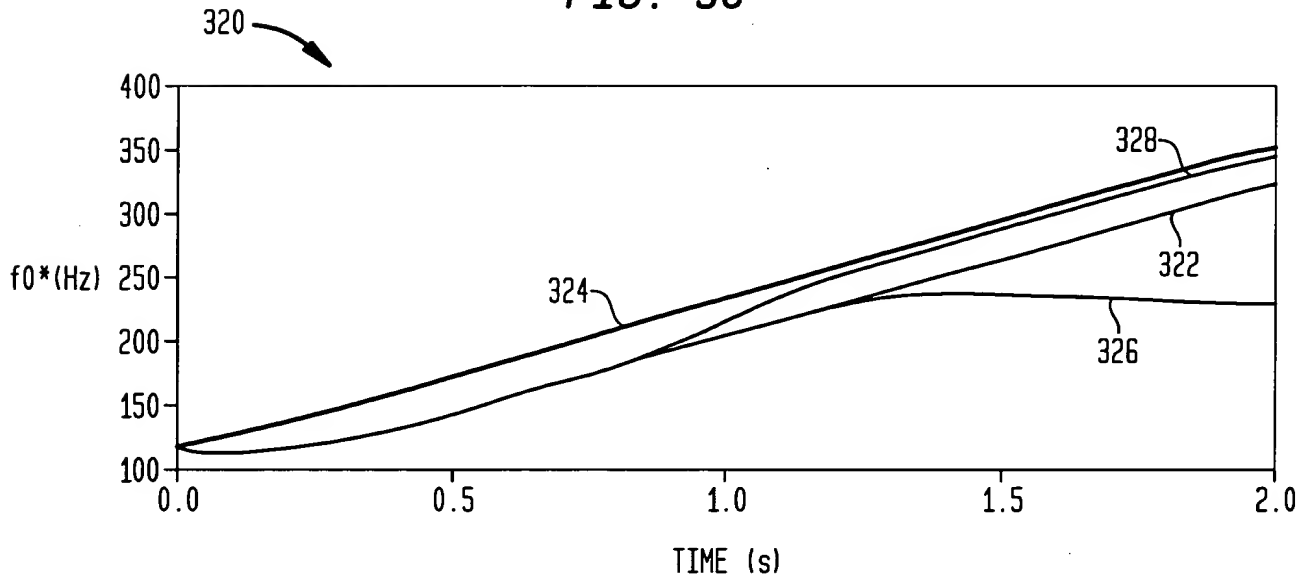

320
400
350
300
250
200
150
100
f0*(Hz)
0.0
0.5
1.0
1.5
2.0
TIME (s)
328
322
324
326

FIG. 3D

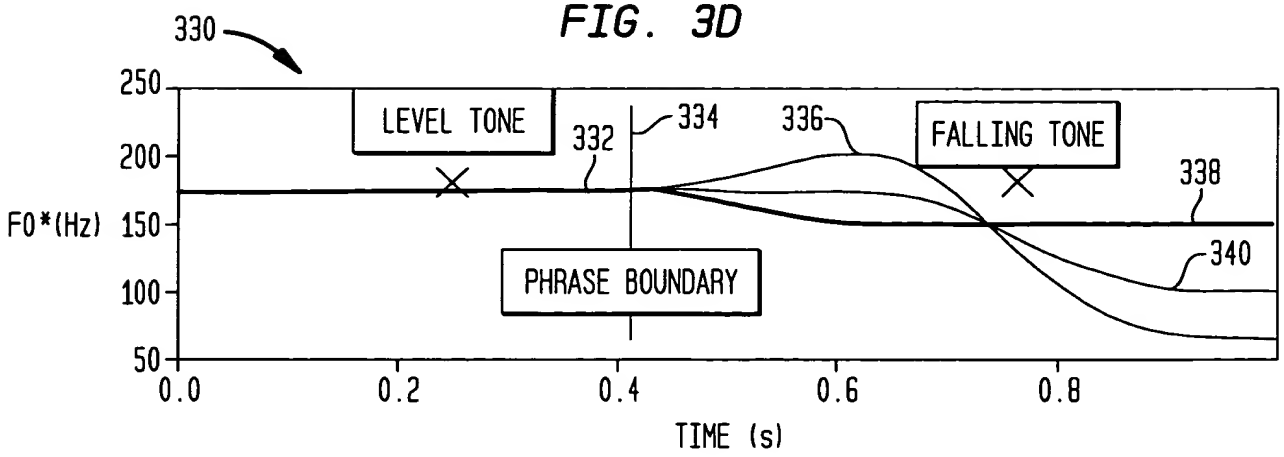

330
250
200
150
100
50
F0*(Hz)
LEVEL TONE
332
334
336
FALLING TONE
338
340
PHRASE BOUNDARY
0.0
0.2
0.4
0.6
0.8
TIME (s)

FIG. 3E

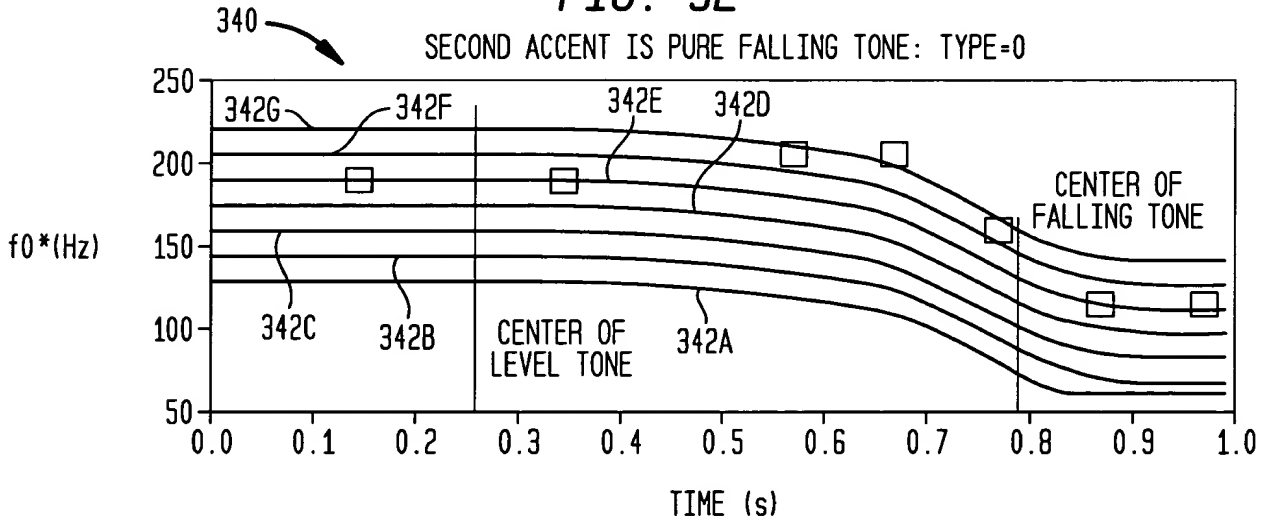

340
SECOND ACCENT IS PURE FALLING TONE: TYPE=0
250
200
150
100
50
f0*(Hz)
342G
342F
342E
342D
CENTER OF
FALLING TONE
342C
342B
CENTER OF
LEVEL TONE
342A
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
TIME (s)

FIG. 3F

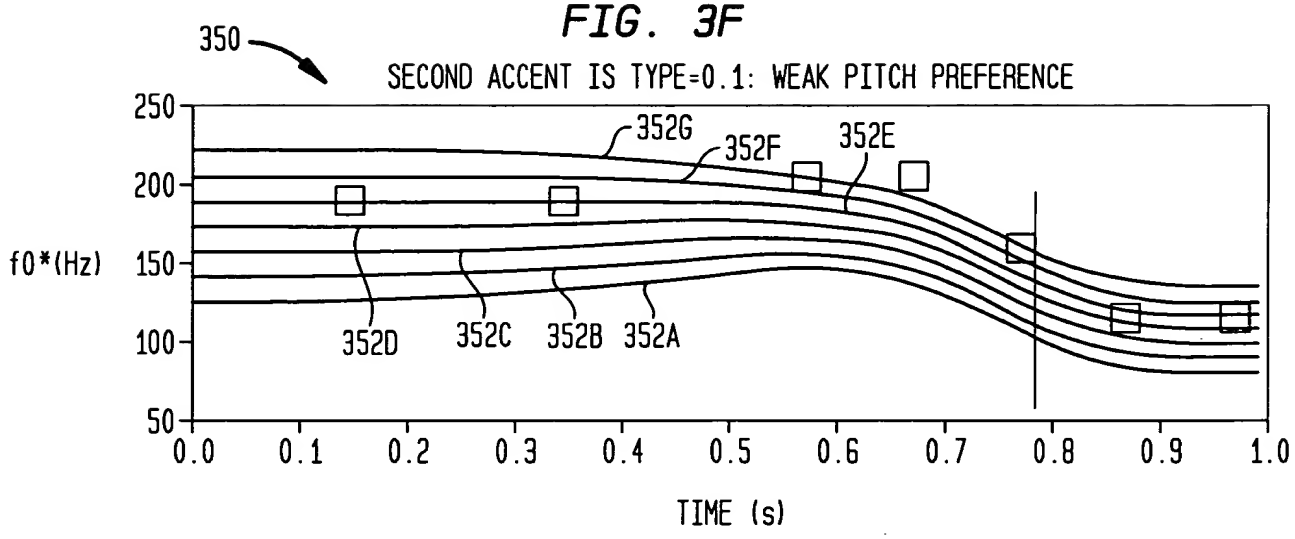

350
SECOND ACCENT IS TYPE=0.1: WEAK PITCH PREFERENCE
352G
352F
352E
352D
352C
352B
352A
f0*(Hz)
250
200
150
100
50
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
TIME (s)

FIG. 3G

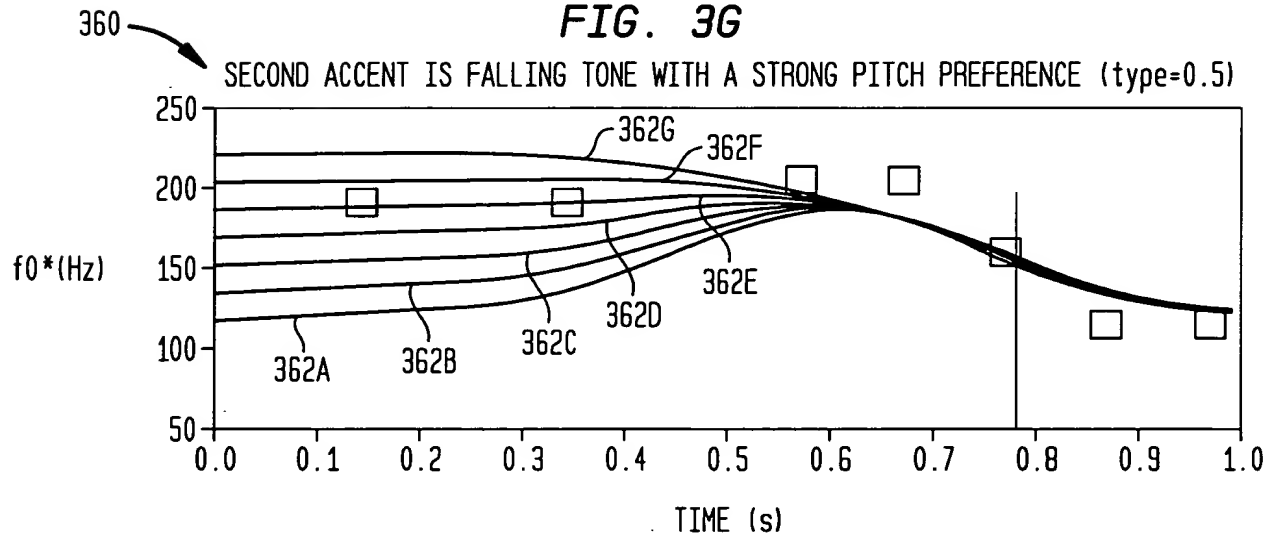

360
SECOND ACCENT IS FALLING TONE WITH A STRONG PITCH PREFERENCE (type=0.5)
362G
362F
362E
362D
362C
362B
362A
f0*(Hz)
250
200
150
100
50
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
TIME (s)

FIG. 3H

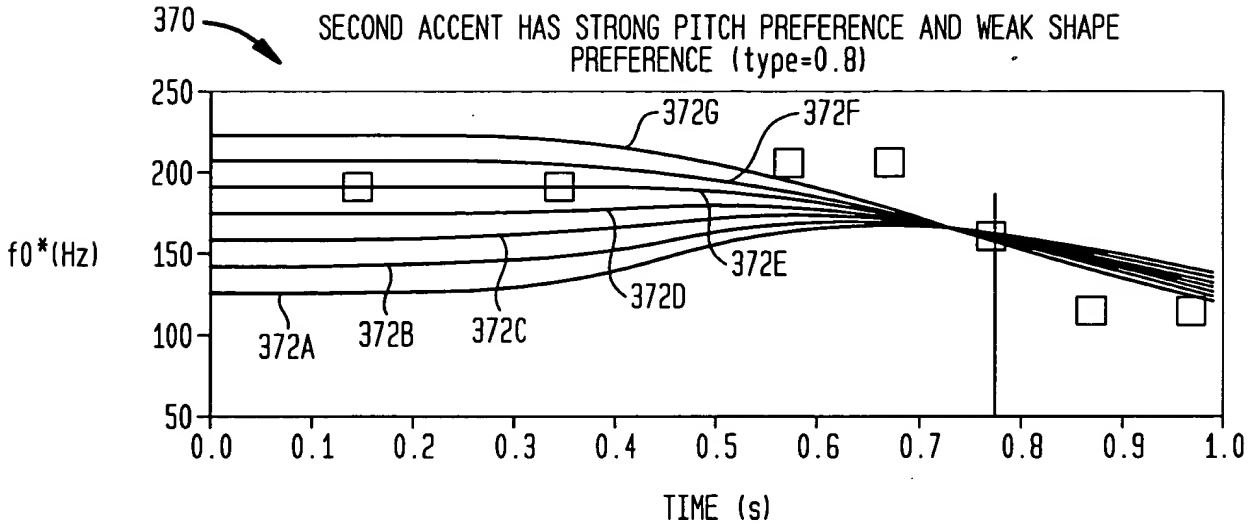

370
SECOND ACCENT HAS STRONG PITCH PREFERENCE AND WEAK SHAPE PREFERENCE (type=0.8)
250
200
150
100
50
f0*(Hz)
372G
372F
372E
372D
372A
372B
372C
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
TIME (s)

FIG. 3I

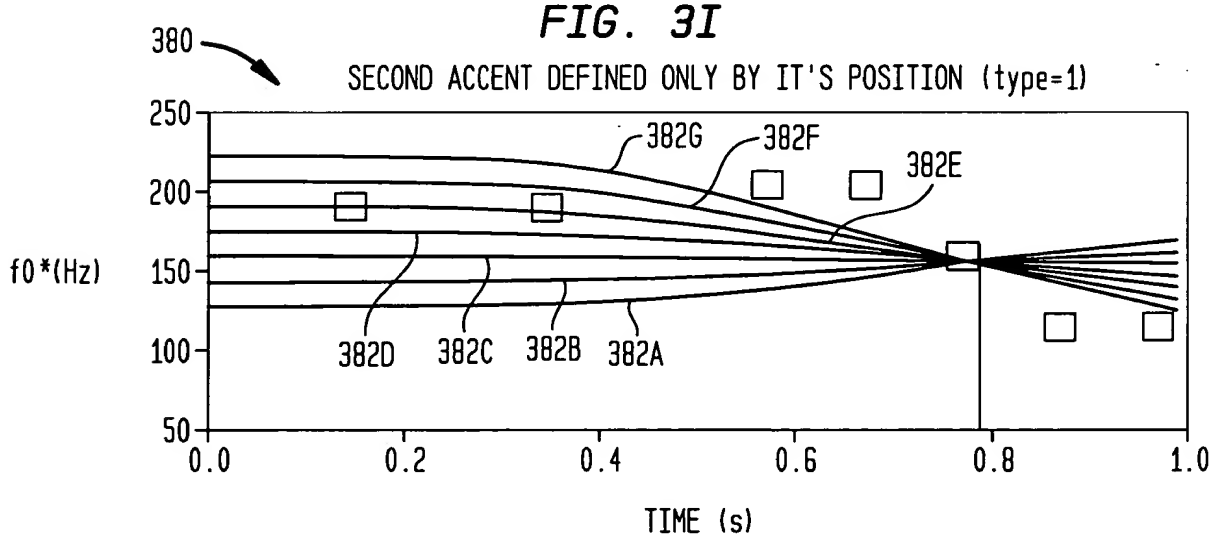

380
SECOND ACCENT DEFINED ONLY BY IT'S POSITION (type=1)
250
200
150
100
50
f0*(Hz)
382G
382F
382E
382D
382C
382B
382A
0.0
0.2
0.4
0.6
0.8
1.0
TIME (s)

FIG. 4

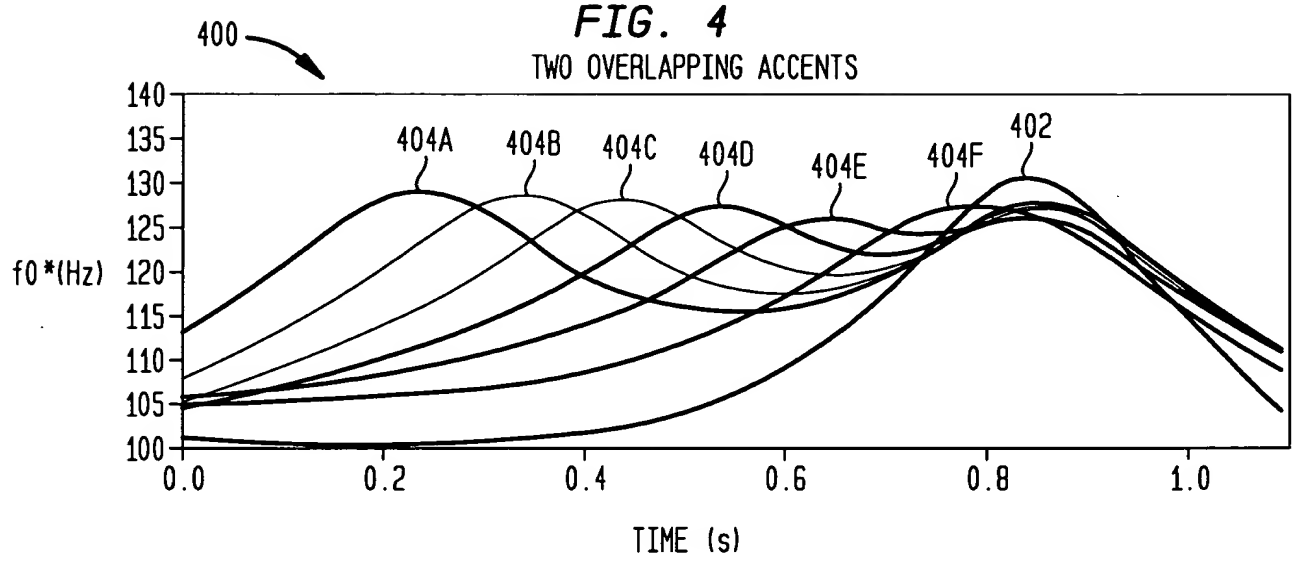

400
TWO OVERLAPPING ACCENTS
404A
404B
404C
404D
404E
404F
402
f0*(Hz)
140
135
130
125
120
115
110
105
100
0.0
0.2
0.4
0.6
0.8
1.0
TIME (s)

FIG. 5

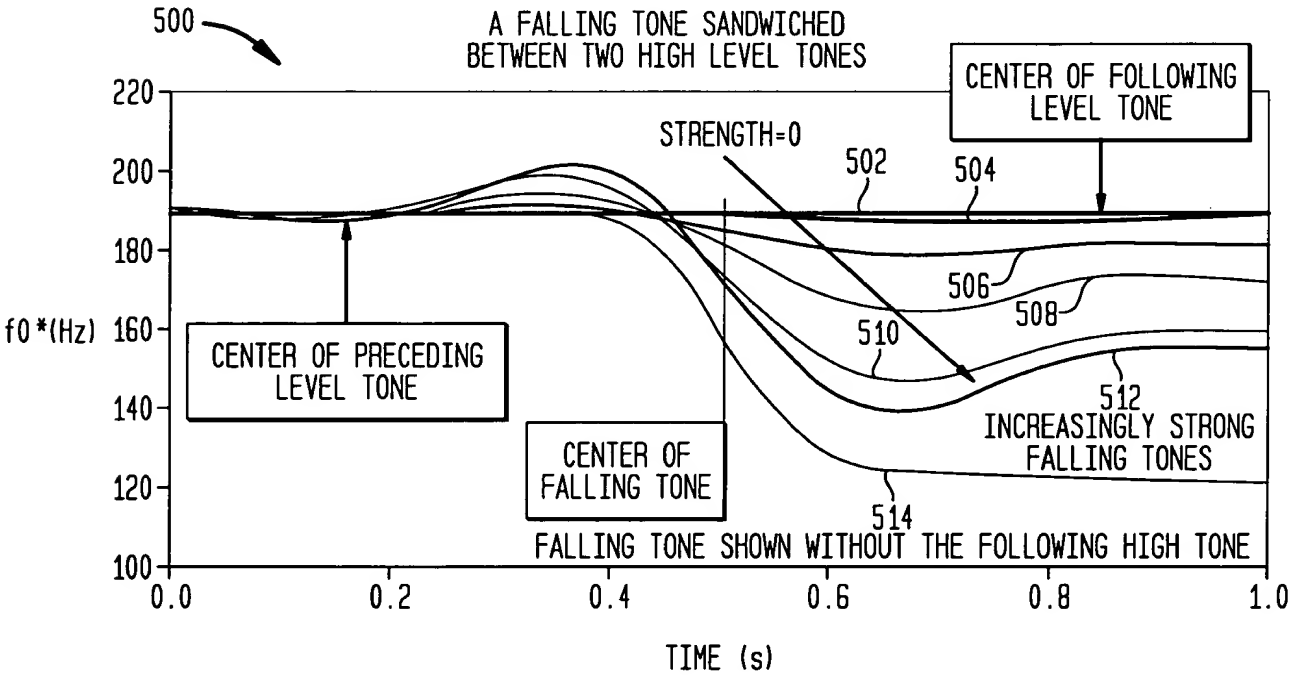

500
A FALLING TONE SANDWICHED
BETWEEN TWO HIGH LEVEL TONES
CENTER OF FOLLOWING
LEVEL TONE
STRENGTH=0
502
504
506
508
510
512
INCREASINGLY STRONG
FALLING TONES
514
CENTER OF PRECEDING
LEVEL TONE
CENTER OF
FALLING TONE
FALLING TONE SHOWN WITHOUT THE FOLLOWING HIGH TONE
f0*(Hz)
220
200
180
160
140
120
100
0.0
0.2
0.4
0.6
0.8
1.0
TIME (s)

FIG. 6

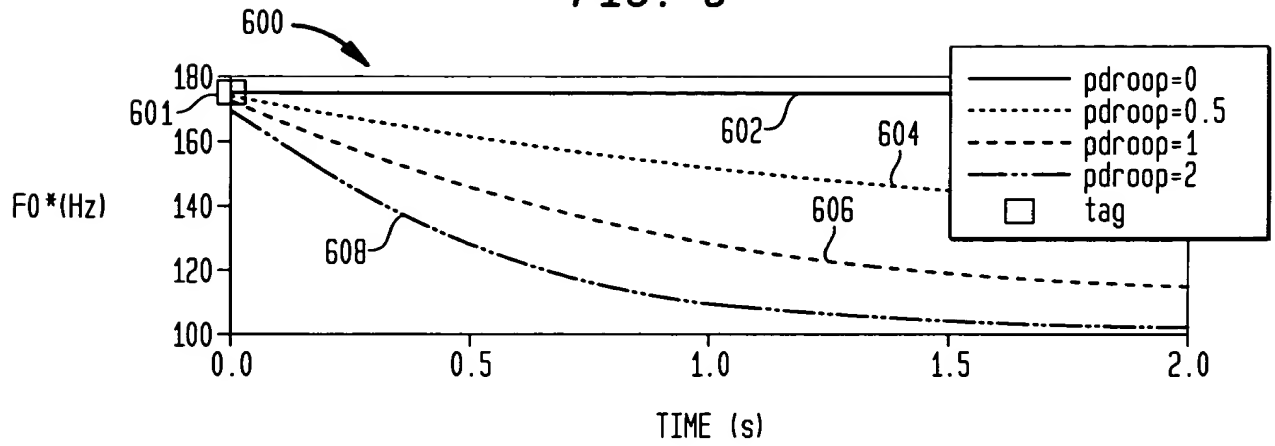

600
601
602
604
606
608
180
160
140
120
100
F0*(Hz)
0.0
0.5
1.0
1.5
2.0
TIME (s)
pdroop=0
pdroop=0.5
pdroop=1
pdroop=2
tag

FIG. 7

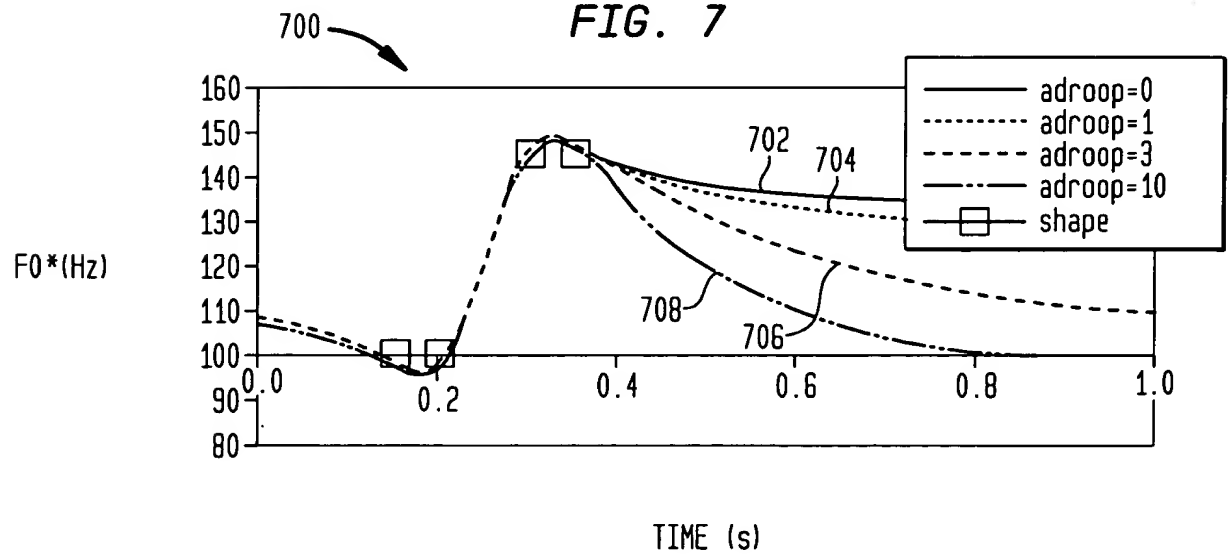

700
702
704
706
708
160
150
140
130
120
110
100
90
80
F0*(Hz)
0.0
0.2
0.4
0.6
0.8
1.0
TIME (s)
adroop=0
adroop=1
adroop=3
adroop=10
shape

FIG. 8

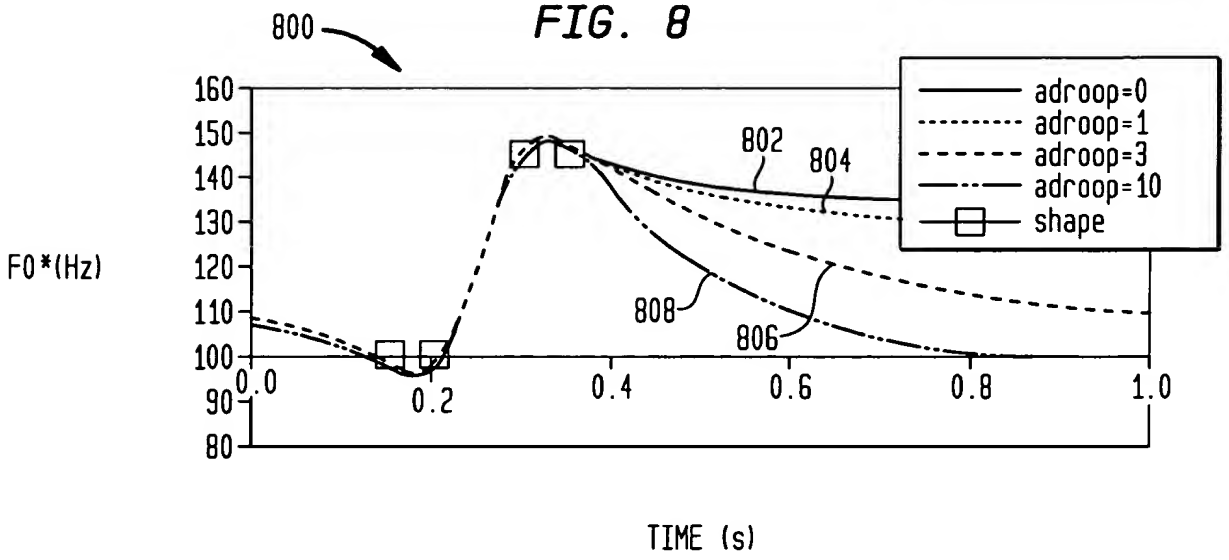
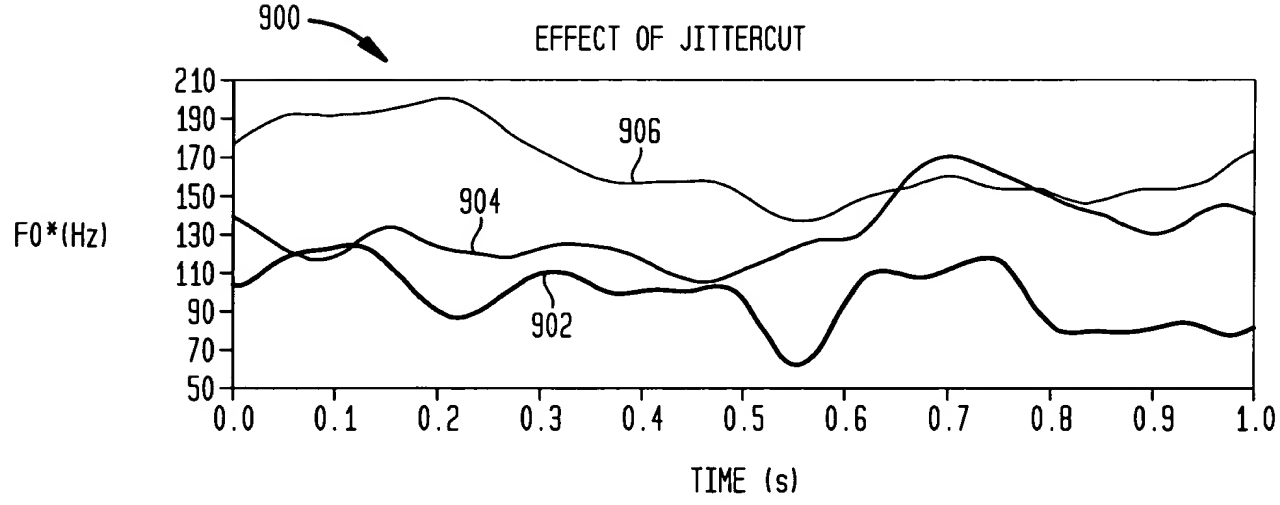
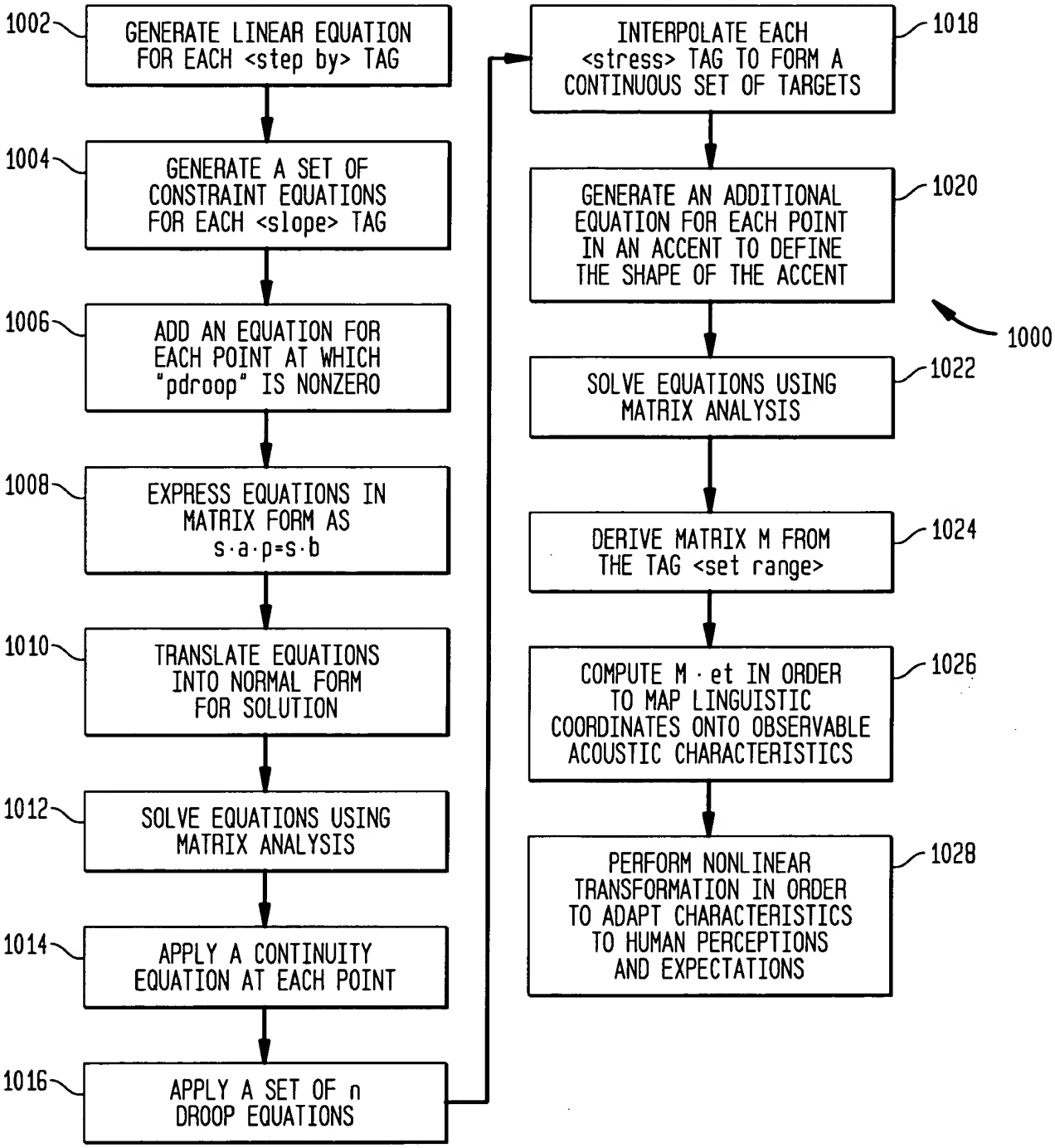


FIG. 9



Petitioner's Exhibit 1005 Page 0019

FIG. 10


1002
GENERATE LINEAR EQUATION FOR EACH <step by> TAG
1004
GENERATE A SET OF CONSTRAINT EQUATIONS FOR EACH <slope> TAG
1006
ADD AN EQUATION FOR EACH POINT AT WHICH "pdroop" IS NONZERO
1008
EXPRESS EQUATIONS IN MATRIX FORM AS s·a·p=s·b
1010
TRANSLATE EQUATIONS INTO NORMAL FORM FOR SOLUTION
1012
SOLVE EQUATIONS USING MATRIX ANALYSIS
1014
APPLY A CONTINUITY EQUATION AT EACH POINT
1016
APPLY A SET OF n DROOP EQUATIONS
1018
INTERPOLATE EACH <stress> TAG TO FORM A CONTINUOUS SET OF TARGETS
1020
GENERATE AN ADDITIONAL EQUATION FOR EACH POINT IN AN ACCENT TO DEFINE THE SHAPE OF THE ACCENT
1000
1022
SOLVE EQUATIONS USING MATRIX ANALYSIS
1024
DERIVE MATRIX M FROM THE TAG <set range>
1026
COMPUTE M · et IN ORDER TO MAP LINGUISTIC COORDINATES ONTO OBSERVABLE ACOUSTIC CHARACTERISTICS
1028
PERFORM NONLINEAR TRANSFORMATION IN ORDER TO ADAPT CHARACTERISTICS TO HUMAN PERCEPTIONS AND EXPECTATIONS

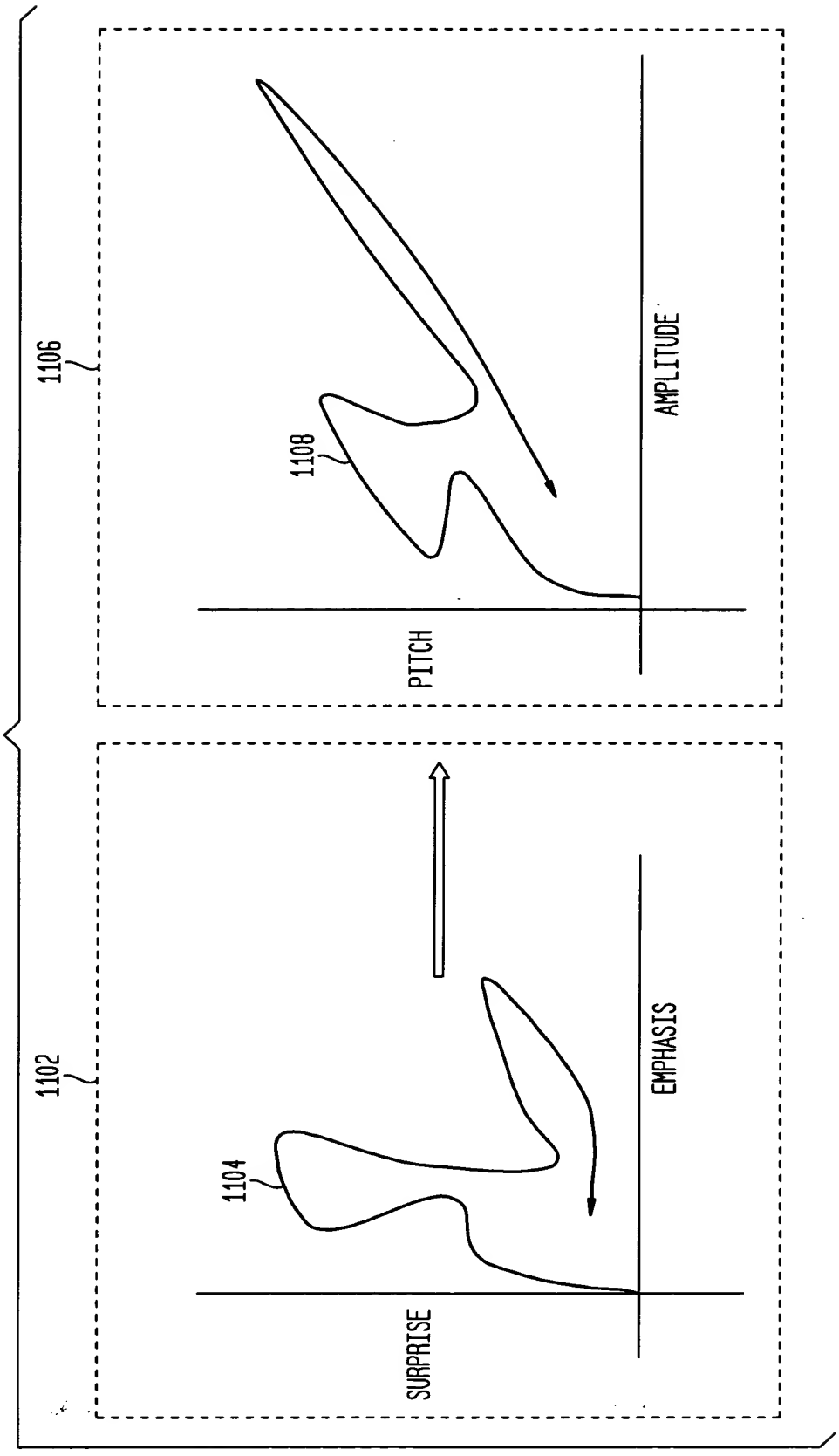


FIG. 11

FIG. 12

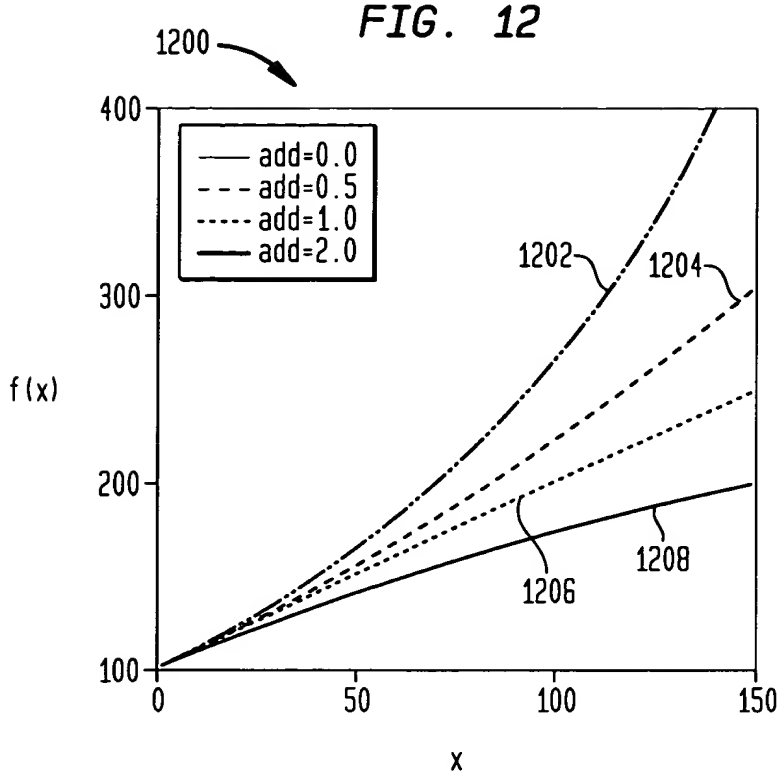

1200
400
300
200
100
0
50
100
150
f(x)
x
add=0.0
add=0.5
add=1.0
add=2.0
1202
1204
1206
1208

FIG. 13

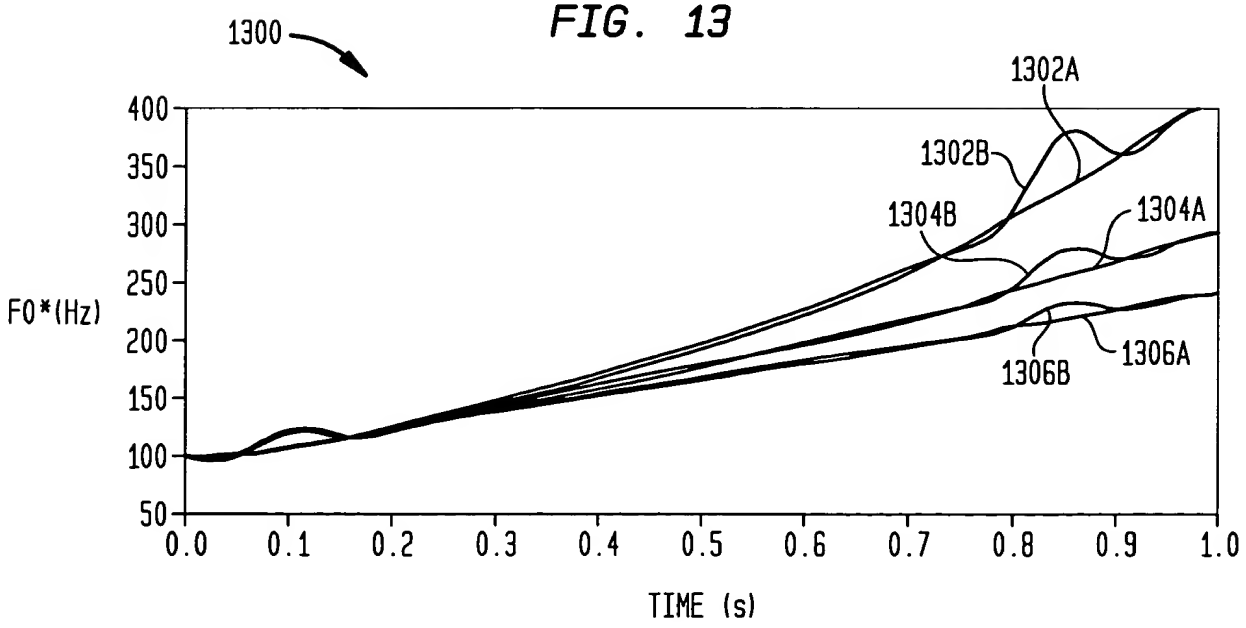

1300
400
350
300
250
200
150
100
50
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
F0*(Hz)
TIME (s)
1302A
1302B
1304B
1304A
1306B
1306A

FIG. 14A

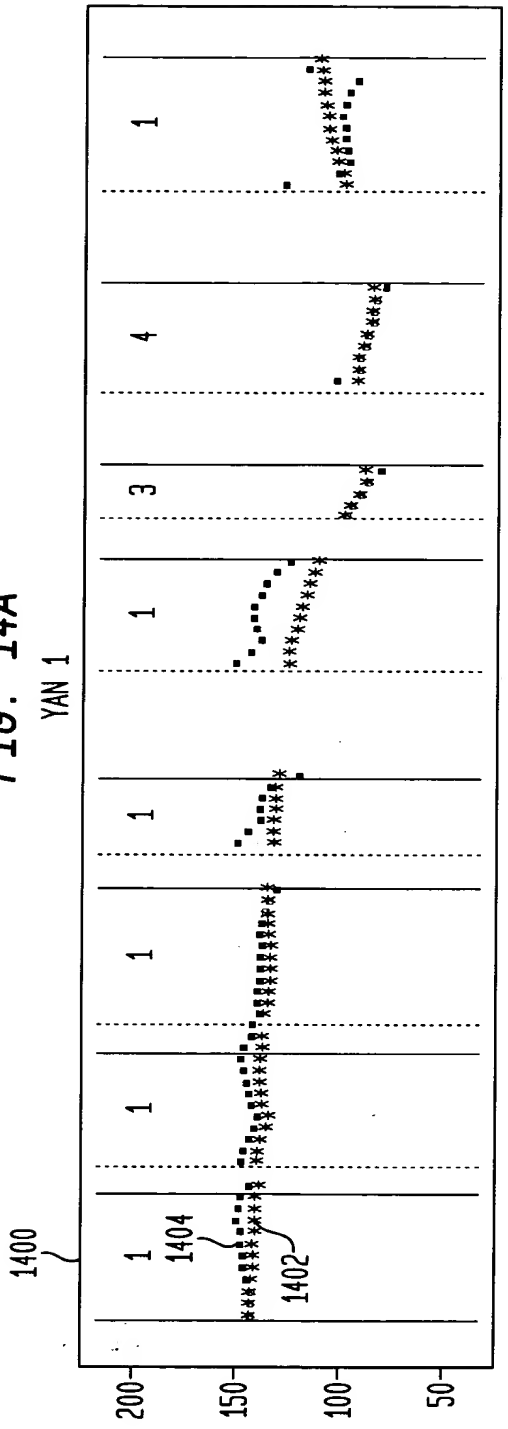
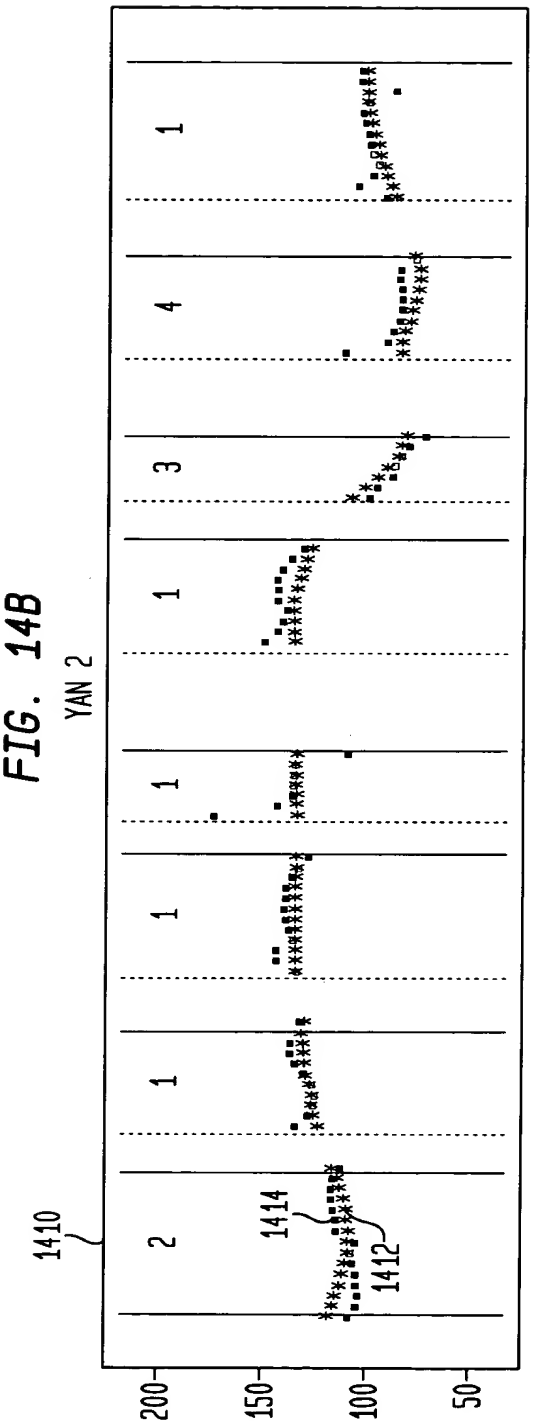


FIG. 14B



20020150286

FIG. 14C

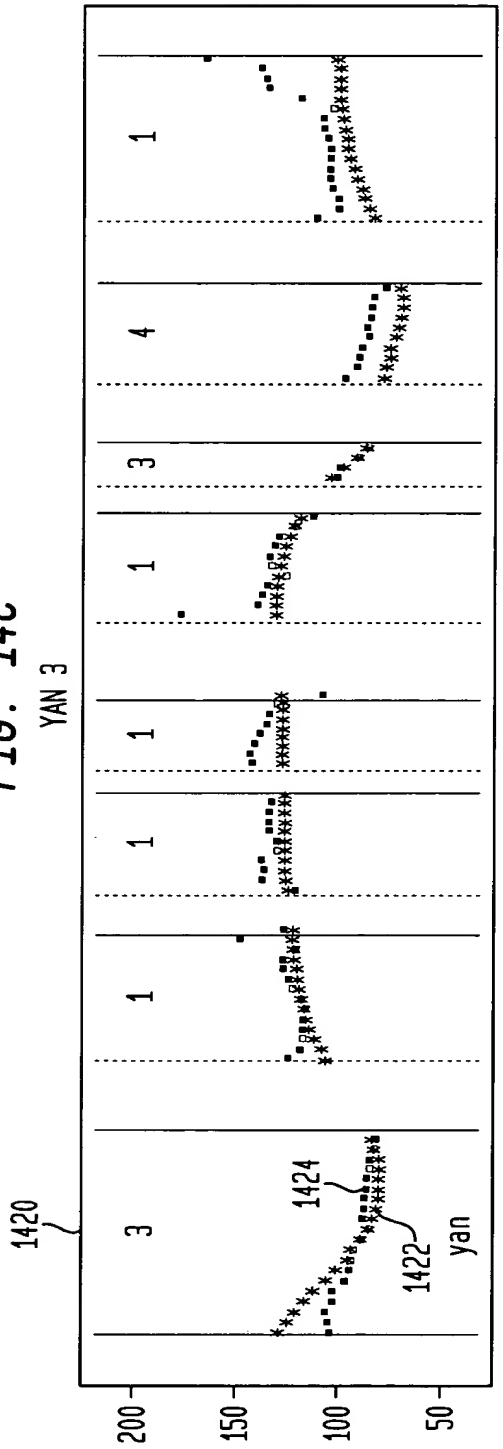
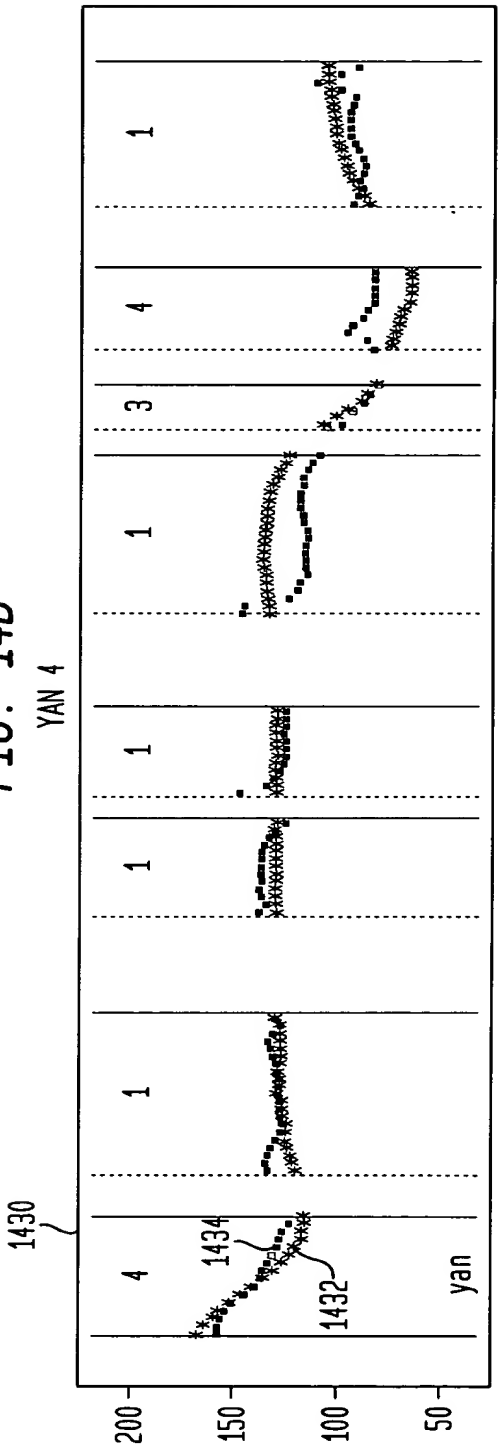


FIG. 14D



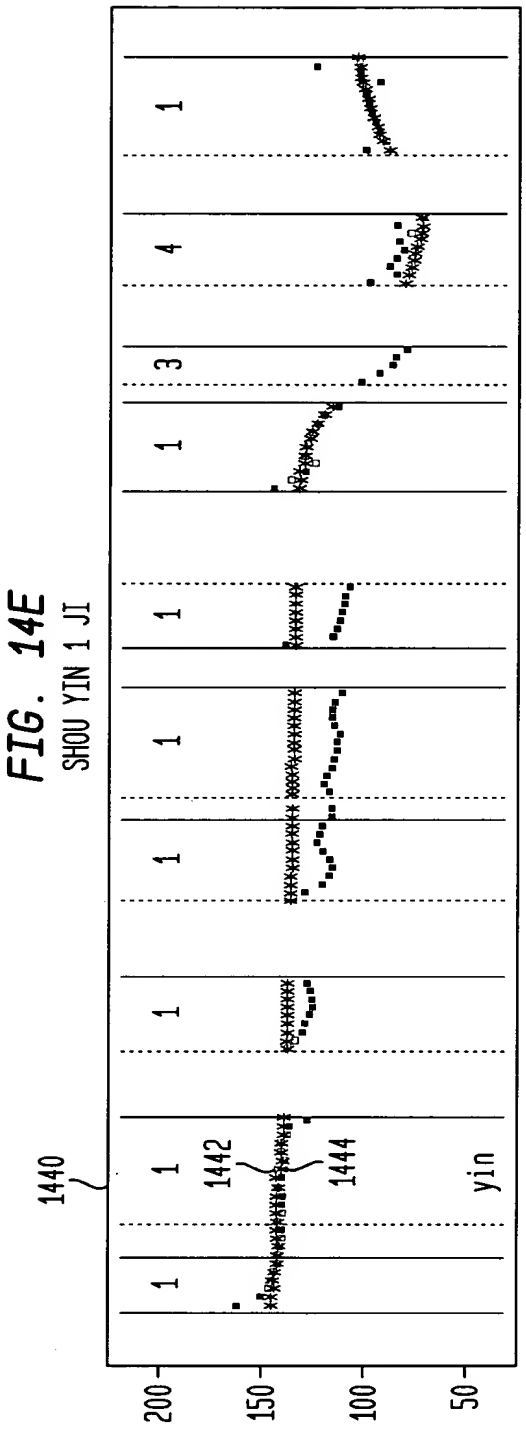


FIG. 14E
SHOU YIN 1 JI

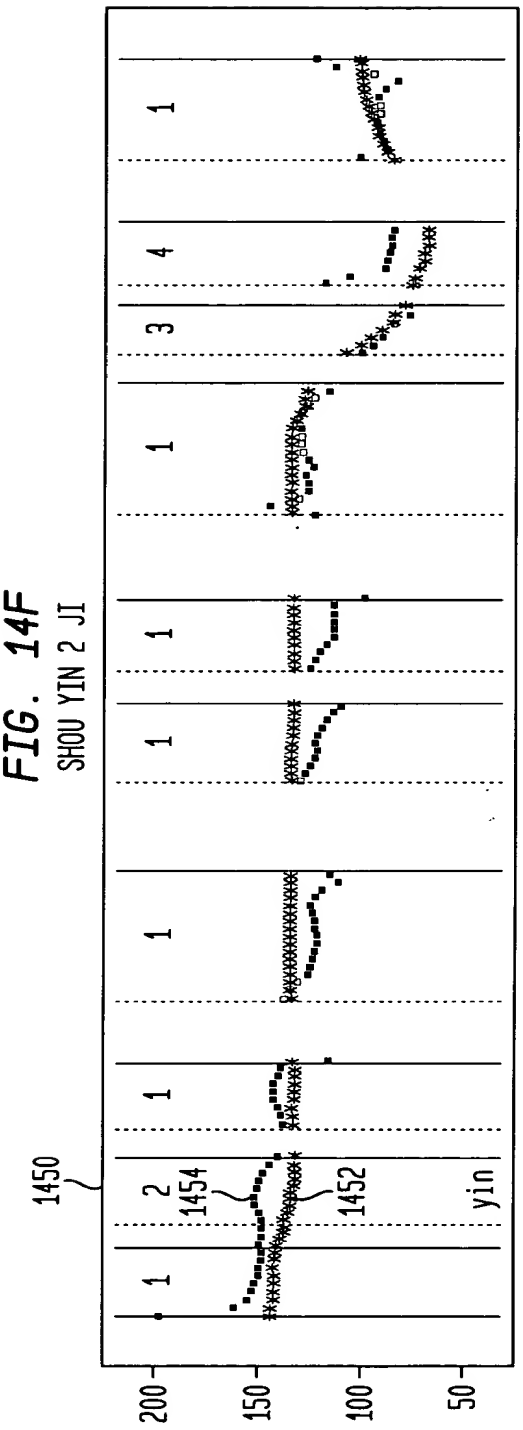


FIG. 14F
SHOU YIN 2 JI

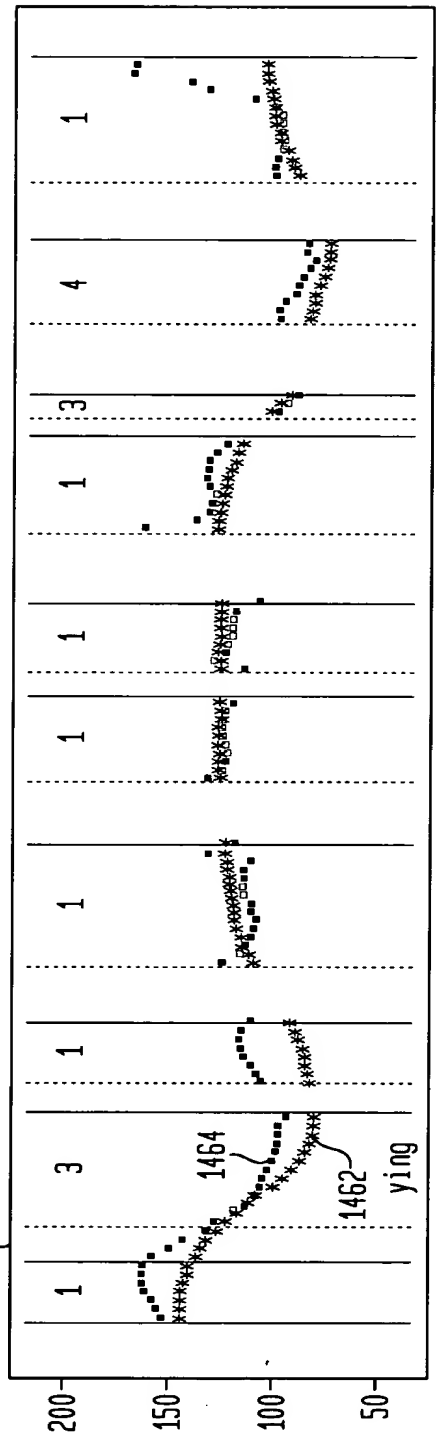


FIG. 14G
SHOU YING3 JI

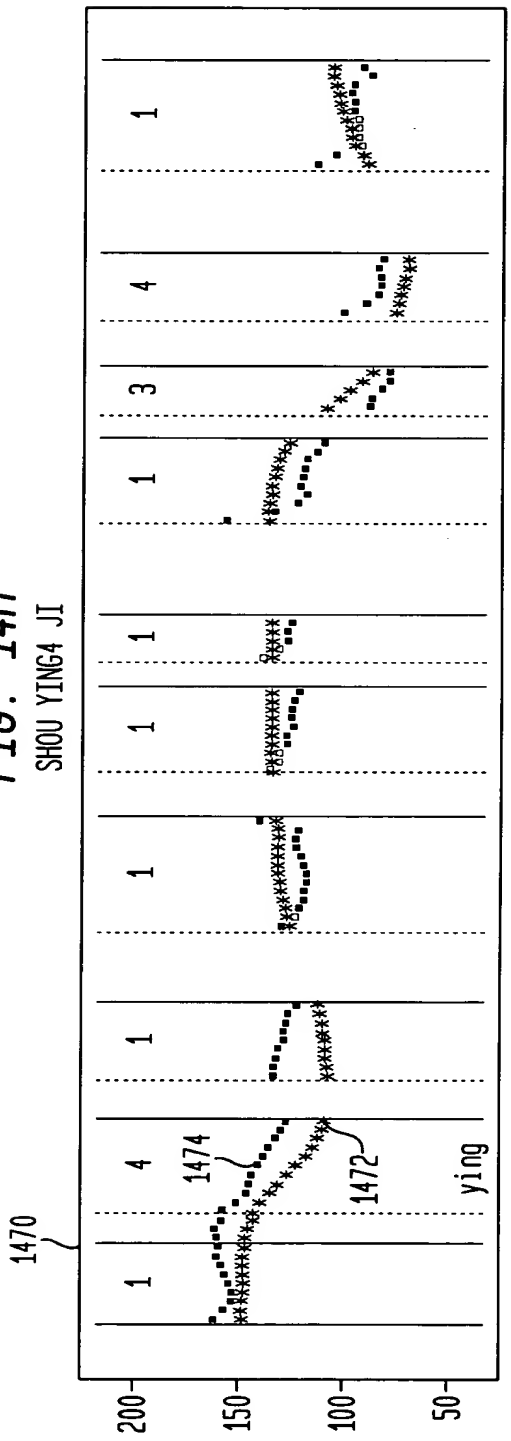


FIG. 14H
SHOU YING4 JI

FIG. 15

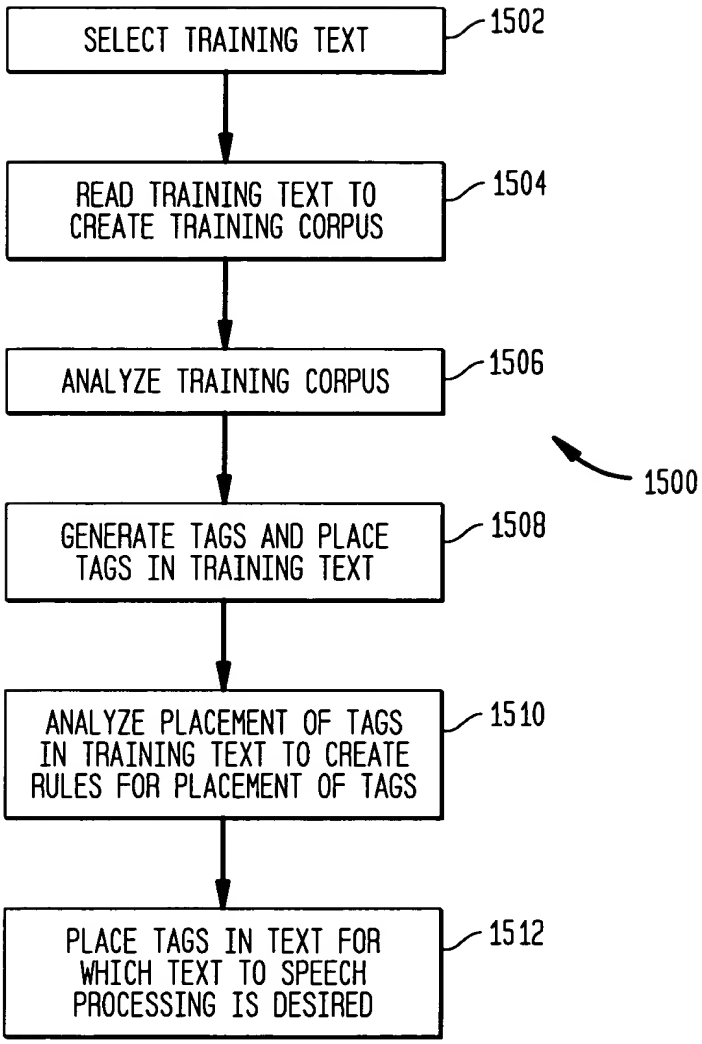

SELECT TRAINING TEXT
1502
READ TRAINING TEXT TO CREATE TRAINING CORPUS
1504
ANALYZE TRAINING CORPUS
1506
1500
GENERATE TAGS AND PLACE TAGS IN TRAINING TEXT
1508
ANALYZE PLACEMENT OF TAGS IN TRAINING TEXT TO CREATE RULES FOR PLACEMENT OF TAGS
1510
PLACE TAGS IN TEXT FOR WHICH TEXT TO SPEECH PROCESSING IS DESIRED
1512

FIG. 16

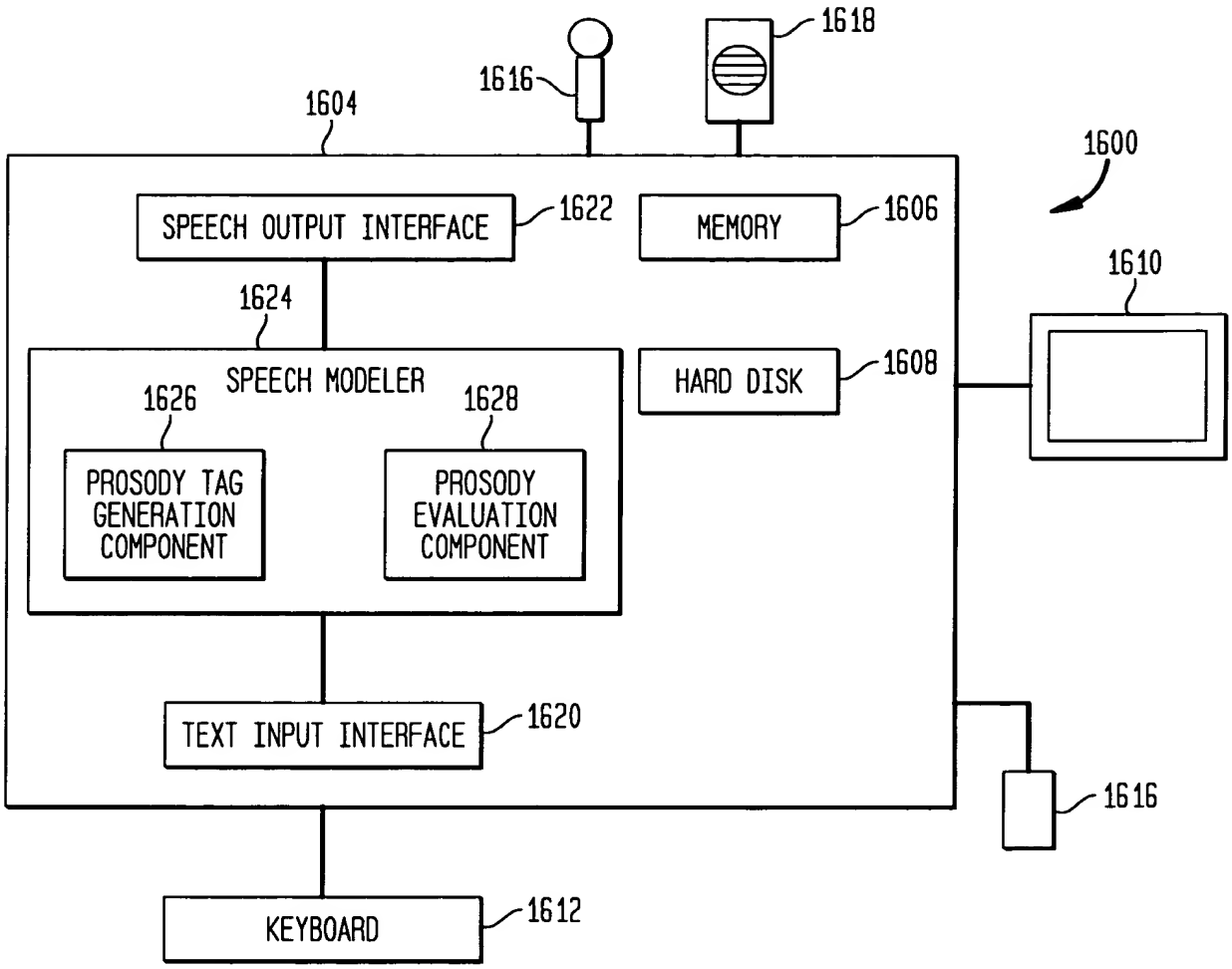
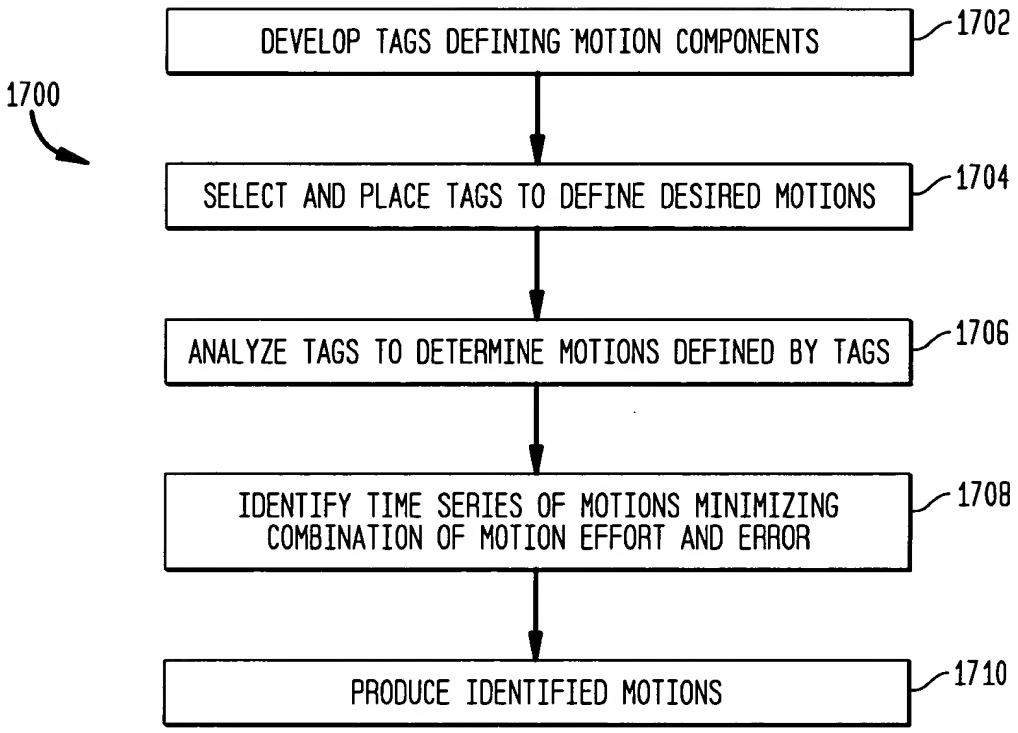

1618
1616
1604
1600
SPEECH OUTPUT INTERFACE
1622
MEMORY
1606
1610
1624
SPEECH MODELER
1626
1628
HARD DISK
1608
PROSODY TAG GENERATION COMPONENT
PROSODY EVALUATION COMPONENT
TEXT INPUT INTERFACE
1620
1616
KEYBOARD
1612

FIG. 17


1700
DEVELOP TAGS DEFINING MOTION COMPONENTS
1702
SELECT AND PLACE TAGS TO DEFINE DESIRED MOTIONS
1704
ANALYZE TAGS TO DETERMINE MOTIONS DEFINED BY TAGS
1706
IDENTIFY TIME SERIES OF MOTIONS MINIMIZING COMBINATION OF MOTION EFFORT AND ERROR
1708
PRODUCE IDENTIFIED MOTIONS
1710